APHIS Evaluation of Foot and Mouth Disease Status of Greece

Animal and Plant Health Inspection Service
Veterinary Services

Centers for Epidemiology and Animal Health
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Executive Summary

The United States has been asked to declare that Greece is a foot and mouth disease (FMD)-free country. This request follows a series of FMD outbreaks in Greece that began in July 2000 and ended in September 2000. Previously, Greece had an outbreak of FMD, serotype O1, in the Prefecture of Evros in September 1996. The 1996 disease outbreak was eradicated by applying a stamping out/nonvaccination policy. Greece regained OIE status of "FMD-free country without vaccination" in May 1998 and held it until July 2000, when it was suspended because of a new incursion of FMD virus (FMDV) serotype Asia 1. FMDV serotype Asia 1 had occurred earlier in Greece in 1961 – again in Evros – and it was eradicated using partial slaughter and vaccination (1).

In June 1999, APHIS published a proposed rule to recognize Greece as free from foot and mouth disease (2). However, on July 12, 2000, before APHIS published a final rule, Greece reported an outbreak of FMD. Therefore, APHIS recognition of FMD freedom was delayed.

In May 2001, after the FMD outbreak in the United Kingdom had spread to other European Union (EU) member states, APHIS conducted a risk assessment (3) on EU member states that had previously been declared free from FMD. APHIS did not consider Greece for regionalization when it conducted this assessment because it had not officially recognized Greece as FMD-free. This evaluation of disease status, therefore, represents an assessment of the FMD status of Greece, separate from the EU member states evaluation.

APHIS representatives conducted a site visit to Greece in January 2001 to obtain evidence supporting a request for disease freedom and to obtain information for this evaluation (4).

Greece believes that Turkey was the source of infection leading to the 2000 outbreak. Turkey reported outbreaks of FMDV serotype Asia 1 to the OIE in every month of 2000 except January and February (5). However, there is no documentation that supports an epidemiological link between the first primary outbreak to those in Turkey.

This evaluation of FMD status documents the following information:

- FMD has been effectively controlled and eradicated from Greece,
- FMD is not known to exist in Greece at this time,
- Greece maintains control over the movement of animals and animal products from regions of higher risk,
- Greece maintains a surveillance system capable of rapidly detecting FMD should the disease be introduced into the country, with more intense scrutiny in the Evros delta bordering Turkey,
- Greece has the laws, policies and infrastructure to detect, respond to and eliminate any occurrence of FMD,
- Greece is working with neighboring countries to address risk factors presented by those countries, and
- the animal health status in the Prefecture of Evros will continue to be closely monitored.

APHIS identified the potential for disease introduction across the border with Turkey and effectiveness of monitoring and surveillance activities as two factors that affect the risk of introducing FMDV into the United States from Greece.

APHIS evaluated these factors in the context of current EU and US regulations on the import of animals and meat from Greece. Current regulations of both the EU and United States include mitigations to address risks. EU regulations included specific surveillance and control activities and certification that meat did not originate from FMD countries or was commingled with meat from Greece during and immediately after the FMD outbreak (6). However, those special EU regulations were rescinded when Greece certified that FMD had been eradicated (7). APHIS can, under current regulations (8), continue to require appropriate certifications for animals and products, including certification that meat from regions considered FMD-free is not commingled with meat from regions not considered as FMD-free.

Introduction

Foot and mouth disease (FMD), serotype Asia 1, was clinically suspected in the Prefecture of Evros, Northeastern Greece, on 10 July 2000. Laboratory confirmation occurred on 11 July 2000 and the outbreak was reported to the OIE on 12 July 2000. Between 10 July 2000 and 10 September 2000, 14 outbreaks of FMDV (foot and mouth disease virus), serotype Asia 1, were reported in Northeastern Greece, 12 in the Prefecture of Evros and 2 in the Prefecture of Xanthi (9)[1].

The OIE World Reference Laboratory for FMD (Pirbright Laboratory, United Kingdom), confirmed that the Greece isolate of FMD virus, serotype Asia 1, is genetically identical to one of the Turkish strains isolated in various parts of that country since late 1999 and advancing steadily westwards towards Greece from Iran and Iraq on the east. It was the shared opinion of foreign and Greek experts that the most likely means of transmission of FMDV into Greece was direct contact between animals along "weak" points on the border between Turkey and Greece in the Evros delta region. In a description of the outbreaks, at least two such points were identified as potential infection sites (10).

Objective

The objective of this evaluation of FMD status is to assess the risk factors for FMD virus transmission that would be associated with initiation of trade in susceptible animals and animal products between Greece and the United States.

Information requested

Sources of information for this evaluation include published literature, EU legislation (11), documents provided by the European Commission (EC) (12), and reports to the Office International des Epizooties (OIE) (13). APHIS downloaded information from EC, Greece and Turkey web sites on the topics that were identified as most critical to its evaluation. APHIS further requested information from Greece on the following specific risk factors.

- Authority, organization, and infrastructure of the veterinary services organization
- Disease surveillance in the region of the outbreaks
- Diagnostic laboratory capabilities
- Current disease status in the region of the outbreaks
- Active disease control program if the agent is known to exist in the region
- Vaccination status of the region
- Disease status of adjacent regions
- Separation of the region from regions of higher risk through physical or other barriers
- Control of movements of animals and animal products from regions of higher risk
- Livestock demographics and marketing practices in the region
- Emergency response capability

[1] Dates are from the 7th Follow-up Report, Situation as of 4 November 2000. No outbreaks were reported after 10 September 2000.

Regulations affecting FMD status evaluation

European Union FMD control requirements

Because of the open borders existing in the EU, it is important to understand applicable EU legislation when evaluating the risk of introducing FMDV into the United States from Greece. Council Directive 85/511/EEC (11) and Commission Decision 2000/486/EC (6) provided the basis for EC control of FMD during the outbreak. The directive requires that, immediately upon confirmation of FMD, a 3 km radius protection zone and a 10 km radius surveillance zone be established around the outbreak. A EU team is dispatched to verify the situation and the application of control procedures and safeguards.

EU legislation also requires that the following actions be taken on affected premises in the 3 km protection zone.

- All susceptible animals must be depopulated immediately and properly disposed of.
- Meat and animals from affected premises must be traced and properly disposed of.
- Milk and milk products must be destroyed or properly treated to eliminate the FMD virus.

In addition, the following actions must be taken on non-affected premises within the 3 km protection zone.

- A census must be taken of all premises with susceptible animals.
- All premises must be subjected to specified periodic veterinary inspection.
- Animal movements are banned for 15 days except for transportation to emergency slaughter under official supervision.
- Measures must be maintained for at least 15 days after all animals have been depopulated and disposed of and the premises have been appropriately cleaned and disinfected.

Moreover, certain actions must be taken within the 10 km surveillance zone that surrounds the protection zone.

- A census must be taken of all premises with susceptible animals.
- Animal movements are banned except to pasture and emergency slaughter under official supervision.
- For the first 15 days following FMD confirmation, no animal movements outside the surveillance zone are allowed.
- During the second 15 days, animal movement is allowed outside the surveillance zone but to emergency slaughter only.
- Measures must be maintained for at least **30 days** after all animals on affected premises have been depopulated, properly disposed of, and the premises have been appropriately cleaned and disinfected.

After the July 2000 outbreak occurred in Greece and as the disease spread, the EU initiated the following additional control measures (14):

- Implementation of increased FMD trivalent vaccination in Turkey (EU sponsored a trivalent vaccination program in the Thrace region of Turkey adjacent to the Evros delta region in Greece)
- Acceleration of the Epidemio-Vigilance Rotational System (EVROS) automated epidemiology-surveillance and crisis management system launched in Greece in 2000, supported by European Commission Decision 2000/71/EC

The following actions taken by the Greece veterinary services reflect the requirements of Commission Directive 2000/486/EC (6):

- Movements had to be authorized by competent authorities at the place of departure.
- Notification had to be provided to authorities at the destination point at least 24 hours prior to movement.
- During transport, the animals were not allowed to contact animals from another holding unless they were being transported for slaughter. Animals transported from farm to farm or from farm to slaughterhouse through an assembly center were required to have resided on the premises from which they were being dispatched for the previous 30 days.

On 1 December 2000 the European Commission repealed Directive 2000/486/EC after it was determined that Greece had experienced no further outbreaks of FMD after 10 September 2000 (7).

APHIS regulations applicable to FMD-free regions

APHIS regulations (8) require certification[2] of meat originating from FMD-free regions when the regions supplement their national meat supply by the importation of fresh (chilled or frozen) meat from regions infected with FMD; have a common land border with regions designated as FMD-affected; or import live animals from FMD-affected regions.

Therefore, even though the EU may release animal and product movement restrictions after 30 days, APHIS may continue to apply limited restrictions. APHIS requires certification that the meat did not originate from a region APHIS considered FMD-affected and had not been commingled with material from a region that APHIS considered FMD-affected. Under existing regulations, APHIS will require similar permit restrictions for live animals (15). Thus, under existing APHIS regulations, even if APHIS declared Greece free of FMD, Greece could face limited restrictions on trade of meat products with the United States because the land border with Turkey is FMD-affected.

[2] The regulation states that the certification must be by a full-time salaried veterinary official of the agency in the national government that is responsible for the health of the animals within that region.

OIE FMD animal health code (16)

The OIE FMD International Animal Health Code – 2001 states in Article 2.1.1.2 that to be listed in FMD-free countries where vaccination is not practiced, a country should (among other things) send a declaration to the OIE that there has been no *outbreak* of FMD and no vaccination has been carried out for at least 12 months, with documented evidence that a effective system of surveillance is in operation and that all regulatory measures for the prevention and control of FMD have been implemented. This requirement is for the purpose of *adding a country to the FMD-free without vaccination list for the first time*. The United States follows this code but has never added Greece to the US list. This evaluation focuses on adding Greece to the US list since it has been 12 months since the last outbreak in Greece (10 September 2000).

Under Article 2.1.1.3, OIE FMD Code specifies that if an FMD-free country where vaccination is practiced wishes to change its status to FMD-free country where vaccination is not practiced, a waiting period of 12 months after vaccination has ceased is required. Greece vaccinated for control in 1961, but not since, and, therefore, also qualifies under this article. Turkey, however, controls with vaccination, thus presenting a risk to Greece's status of freedom without vaccination.

OIE Article 2.1.1.5 states that an FMD-free zone where vaccination is practiced can be established in a country with a free zone where vaccination is not practiced or in a country of which parts are still infected. The same article also discusses establishing a buffer zone from neighboring countries enforced by physical or geographical barriers and animal health measures that effectively prevent the entry of a virus.

Article 2.1.1.6 states that when a country which has been declared FMD-free can no longer fulfill the requirements of being considered free, specific waiting periods must elapse before the country can regain the disease-free status. Three months must elapse after the last *case*, where stamping-out and serological surveillance is applied, or three months after the slaughter of the last vaccinated animal if emergency vaccination is applied. Greece did not apply emergency vaccination during their 2000 outbreaks.

Evaluation of risk factors

The following is a summary of FMD-related information available for Greece. The summary is intended to address issues relevant to the probability that FMDV-infected animals or products would be released for export to the United States if trade restrictions were lifted.

Information relevant to FMD outbreaks in Greece

The first FMD outbreaks in Greece occurred in July 2000, the last in September 2000 (see Table 1 and Figure 2 below).

- Greece shares a border with Turkey, an FMD affected country
- Information is provided to international travelers leaving Greece airports and ports

- Greece instituted an internal temporary ban on trade and purchase of animals as a result of the FMD outbreak, a ban which was probably relaxed when EU special provisions were lifted (7)[3].

Information relevant to FMD outbreaks in EU member states

- Advance notification is required for the importation of animals from EU member states
- Animals imported from EU member states are inspected for identity, physical condition and laboratory test results, i.e., health certificates
- Greece conducted tracebacks on all imports from affected member states, unaffected member states, and from third countries
- Ten consignments came from France after January 2001. All consignments were traced, sampled randomly and tested for FMD according to the following criteria:
    - 15% of animals in all consignments from member states
    - 10% of animals in all consignments from third countries
    - In total, 706 samples were tested, all were negative (17).
- Preventive measures are implemented before, during, and after the entry of allied personnel from high risk countries into Greece en route to Kosovo through the seaport and airport of Thessaloniki (18).

Outbreak started:

Location	No. of outbreaks
Evros Delta, Prefecture of Evros, North-Eastern Greece, on the border with Turkey	2 herds

Table 1 below details the 14 FMD outbreaks in six epidemiological episodes. Blank lines in Table 1 separate the six epidemiological episodes; each episode represents independent primary or secondary outbreaks investigated by Greece Veterinary Services. There were three primary outbreaks in the Prefecture of Evros, all the others were secondary outbreaks caused by spread from the primary outbreaks. There was a secondary outbreak in the Prefecture of Xanthi, more than 100 km from the Prefecture of Evros, probably caused deliberately by humans in an episode where criminal charges have been pressed (9, 2nd follow-up report). All the outbreaks except 07/00 in the Prefecture of Evros affected cattle. Outbreak 07/00 was a secondary outbreak affecting 642 sheep where 15 were clinically diseased.

Figure 1 shows Greece and the countries surrounding Greece that are evaluated in this assessment. Figure 2 shows the geographic location of the outbreaks within the two affected prefectures; a location may represent more than one outbreak.

[3] Specific documentation on current internal bans on trade and purchase of animals could not be located.

Table 1. Recapitulation of outbreaks, with a breakdown by epidemiological cluster

Outbreak			Animals present			Suspicion		Confirmation	
No.	Type	Location	Species	No.	Sick	Date	Nature	Date	Nature
00/01	primary	Evros Delta, EVROS	bov	138	12	11 July	clinical	11 July	virology
00/02	secondary	Evros Delta, EVROS	bov	55	5	10 July	clinical	11 July	virology
00/03	secondary	Evros Delta, EVROS	bov	305	6	18 July	clinical	18 July	clinical
00/06	secondary	Evros Delta, EVROS	bov	129	5	27 July	clinical	31 July	virology
00/10	Secondary	Ferres, EVROS	bov	46	5	7 Aug	clinical	10 Aug	serol/VD
00/04	secondary	Ferres, EVROS	bov	160	0	17 July	contact	20 July	serology
00/07	secondary	Ferres, EVROS	sheep	642	15	27 July	clinical	1 Aug	serol/VD
00/08	secondary	Ferres, EVROS	bov	111	10	1 Aug	clinical	3 Aug	serol/VD
00/05	primary	Peplos, EVROS	bov	89	10	19 July	clinical	24 July	serology
00/09	secondary	Potamia, XANTHI	bov	122	73	7 Aug	clinical	8 Aug	serol/VD
00/11	Primary	Mandra, EVROS	bov	58	8	17 Aug	clinical	18Aug	virology
00/13	secondary	Asimenio, EVROS	bov	209	15	7 Sept	clinical	11 Sept	virology
00/14	secondary	Didim/cho, EVROS	bov	228	11	10 Sept	clinical	14 Sept	virology
00/12	secondary	Selino, XANTHI	bov	72	3	19 Aug	clinical	24 Aug	virology

Source: 1, 2

In 1998, Veterinary Services (VS), APHIS, USDA evaluated information provided by Greece on the following 11 risk factors listed in VS regulations as critical to an initial regionalization evaluation (19). The results of the evaluation indicated that the situation with regard to each of those factors in Greece was acceptable (20,21,22). Based on this evaluation and other EU information, VS published a proposed rule to recognize Greece as free from FMD (31). The results of this evaluation were supported by the observations made in a subsequent site visit conducted after FMD had been eliminated (4).

Figure 1. Greece and Bordering Countries

Authority, organization, and infrastructure of the veterinary services organization

The following describes the organizational structure of Greece's veterinary services as provided to VS as part of the 1998/1999 evaluation of risk factors for FMD and swine vesicular disease in Greece[4] (21).

The official veterinary force of Greece has the legal authority, organization, and infrastructure to control and eradicate FMD. The official veterinary force of Greece includes approximately 810 veterinarians, 70 veterinary laboratories, and 190 lay assistants organized under the State Veterinary Service. The field force is dispersed among 51 Local Disease Control Centers, each of which reports to the National Disease Control Center in Athens. In the event of an animal disease emergency, the State Veterinary Service has the authority to call upon police and local authorities to provide support and assistance in depopulating infected premises, disposing of

[4] An attempt was made to update this information but those portions of the Greece Ministry of Agriculture were not yet operational.

animal carcasses, controlling and restricting animal movements, and closing markets and slaughterhouses.

Greece's veterinary infrastructure has been strengthened by financial contributions from the European Union for activities relating to specific diseases. In the case of FMD, financial support has been provided for diagnostic laboratory equipment, data management equipment, and surveillance activities (21).

Figure 2.
Geographic Location of FMD Outbreaks in Greece, 2000.

Additional information is available on the new Greece Ministry of Agriculture, Department of Infectious Diseases & Epidemiology web site. The 1st Part of the web site is a description of the Scope, Competence and Personnel of their veterinary services infrastructure. The 4th Part is a description of Greece's Disease Control and Surveillance Programmes. The 5th Part is a description of Greece's Contingency and Crisis Management Plans (9).

Disease surveillance in the region of the outbreaks

Routine surveillance for targeted diseases is carried out in specified areas of Greece under the Epidemio-Vigilance Rotational System (EVROS). This program, launched in 2000 with the support of the European Commission, is an integrated system of active surveillance for incursions of targeted diseases, including FMD. The program is designed to provide early

warning and effective control of targeted diseases. The program is established on the border areas with Turkey that are primarily at risk for incursions of FMDV. The specified regions include the delta area of Evros, the adjacent prefecture of Rodopi, and the islands south of the Evros delta bordering Turkey: Chios Islands, Samos Islands, Lesvos Islands, and Dodekanisa Islands. Field operations in each area perform the following functions: active surveillance, registration of holdings, animal identification, animal movement control, and inspection of premises and establishments (9, 4th Part).

Routine surveillance in the EVROS program is carried out in four-month 'waves'. Additional surveillance is carried out in all cases of animal movements out of defined geographic areas or to slaughter establishments in the areas. Two zones are defined: Zone A and Zone B. Zone A is a 20 km zone along the Greece-Turkey border in the prefecture of Evros. All other areas are defined as Zone B (9, 4th Part).

Surveillance consists of both clinical and serological monitoring.[5] In each surveillance wave, clinical examinations are performed according to the following schedule:

60% of the sheep in each village, and
100% of the bovines in each village.

In addition, all animals leaving Zone A and 10% of animals in all consignments leaving Zone B must be clinically examined.

Serological monitoring is similar:

60% of all sheep in each village,
all animals leaving Zone A,
10% of animals in all consignments leaving Zone B, and
10 % of all slaughtered animals.

In addition, there is seasonal monitoring for bluetongue, which consists of 30-50 sentinel bovines tested in each prefecture every 15 days from July through December. Results of the surveillance performed through this program can be found at the web site of the Greece Veterinary Administration (23). Seasonal monitoring for bluetongue contributes to the effectiveness of surveillance for FMD.

Additional surveillance which documents control of the outbreak in 2000 is described elsewhere. The number of cattle and sheep infected and depopulated are described at the Ministry of Agriculture web site (23). The 6th Part of the Ministry of Agriculture web site describes the Incursion and Evolution of FMD in Greece in 2000, including Evolution Report, Maps, and Safeguard Measures in Trade. There is also a description relating Greece activities to EU regulations (24).

[5] Quarterly reports presenting test results are available on the Greece Ministry of Agriculture web site (9) in the 4th Part as an output of the EVROS Surveillance and Monitoring Program.

Diagnostic laboratory capabilities

This factor has previously been evaluated by APHIS as acceptable (23). No significant changes have occurred since that time, so no further evaluation is necessary.

Current disease status in the region of the outbreaks

On July 11, 2000, FMDV serotype Asia 1 was officially confirmed in the prefecture of Evros, Greece. This prefecture is in northeastern Greece, bordering Turkey. FMDV serotype O1 last occurred in Greece in this same prefecture in September 1996. The disease was eradicated by applying a stamping out policy without vaccination. Greece's subsequent disease free status was published by the OIE (24). FMDV type Asia 1 was last recorded in Greece in 1961 – again in Evros – and it was then dealt with by partial slaughter and vaccination (1).

In July 2000, the disease was initially suspected through clinical examination of a herd of 50 cattle (25). The clinical examinations were performed as part of the "EVROS" disease surveillance and control program (26). Under this program, all movements of animals within the prefecture of Evros are subject to a permit issued by the local veterinary service after a clinical examination and serological testing of the animals has been carried out with negative results. On July 10, the farmer with the herd in question applied for an animal movement permit. Upon inspection, four or five animals exhibited mild clinical signs of FMD. Diagnostic samples were obtained and the National Crisis Center (NCC) in Athens was immediately notified. A team from NCC arrived later that day, at which time the suspicion was confirmed on clinical grounds and the herd was provisionally designated as FMD outbreak No. 00/01, pending the results of tests. On July 11, the Institute of FMD in Athens reported positive antigen detection against FMDV serotype Asia 1.

From this initial detection on July 11, through September 10 (date of the last outbreak), a total of 14 outbreaks were identified. Of these, 12 outbreaks were in Evros and two were in the prefecture of Xanthi. The spread of disease to Xanthi (outbreak 00/09, Table 1) was directly linked to movement of personnel and inanimate objects from an infected area in Ferres, Evros (outbreak 00/07, Table 1). This jump to Xanthi was a distance of approximately 100 km and has been linked to a potential criminal act of intentional infection to take advantage of the government compensation program (9, 2nd follow-up report).

It appears that there were three primary incursions of FMD along the Evros River, with secondary spread to the 11 other confirmed outbreaks. The working hypothesis for this transmission was direct or indirect contact of animals across the border with Turkey, although no definitive confirmation of active infection in Turkey immediately across the border was obtained. The strain of virus isolated in Greece was genetically fingerprinted at the Institute for Animal Health, Pirbright, UK and was found to be identical to the strain isolated in Turkey in 1999 and 2000, thus confirming a possible source of the disease (26, section 5.1).

Open grazing management practices are prevalent throughout the Evros delta with commingling of all livestock of all species and including wildlife. Therefore, the Greece veterinary service treats this area as a single epidemiological unit. Animals in the south and western parts of the

delta were considered as one unit and were destroyed either on preventive grounds or as potential contacts. Animals in the north and eastern parts of the delta remained unaffected.

Standard control and safeguard measures as laid down in Directive 85/511/EEC (27) were implemented. These included:

- destruction of all susceptible animals in infected and contact premises,[6]
- epidemiological trace backs,
- establishment of protection and surveillance zones around the outbreaks with prohibitions of animals and product movements out of the zones,
- suspension of animal movements to slaughter, markets, and fairs inside the zones, and
- control of people and vehicles inside the zones.

In addition, Greece authorities undertook additional control measures such as a general ban on the movement of susceptible animals and products from the entire affected prefectures, general standstill orders in the affected prefectures until the situation was well defined, and movement controls established in the unaffected prefecture of Rodopi for preventive reasons.

Approximately 5,400 cattle, 2,300 sheep/goats and 300 pigs were destroyed, either in affected or contact holdings. No vaccination was used to control the outbreak. Surveillance measures were instituted to confirm control of the outbreak. This surveillance was started after 21 days had elapsed since the last recorded outbreak in the area. This serological surveillance in sheep and goats was conducted according to the following scheme:

Within protection zones:

- no geographic sampling - 100% of villages were monitored
- no flock sampling - 100% of flocks were monitored
- random within-flock sampling - 10% of animals present with a minimum of 15 animals per flock

Within surveillance zones:

- no geographic sampling - 100% of villages were monitored
- random among-flock selection - 20% of flocks in every village were sampled
- random within-flock sampling - 10% of animals present with a minimum of 15 animals per flock

If inconclusive results to tests were obtained, the individual animals were resampled after 14 days. If positive results were obtained, all animals in the flock were sampled. Sampled animals were each identified by unique ear tags. Based on this scheme, a total of 4,154 samples were projected as necessary to constitute a valid testing program. From September-October 2000, a total of 4,547 samples were collected, all with negative results. During this same time frame, all cattle herds in the protection and surveillance zones were clinically inspected, with negative

[6] Some movements of animals were allowed and indeed took place. These movements were invariably short distance, either to a slaughterhouse or to different premises belonging to the same holding or to different holdings inside the area of jurisdiction of the same Local Veterinary Office. Such movements were subjected to clinical examinations, especially when the animals were destined for a slaughterhouse, but the results were not recorded separately (28).

results, for lesions of FMD. On the basis of this surveillance, Greece has claimed that the control and eradication of the disease had been demonstrated. The European Commission supported these claims of freedom on November 7, 2000 when all restrictions due to FMD were lifted (26).

Active disease control program if the agent is known to exist in the region

The control measures taken to control the outbreak in July-September 2000 were described in the previous paragraphs. Additional information is available at the Ministry of Agriculture web site (9).

Vaccination status of the region

No vaccination was used in control of the outbreak of serotype Asia 1 in 2000 or type O1 in 1996. Vaccination has not been used to control serotype Asia 1 in Greece since 1961 (27).

Disease status of adjacent regions

Following is a brief discussion of countries touching on Greece's land borders. Figure 1 shows that Greece has extensive borders on the Mediterranean and Aegean Seas. The Greece islands off Turkey's borders are discussed above.

Turkey

Foot and mouth disease is endemic in the Anatolia region of Turkey (southwest Turkey bordering on Aegean Sea and near Greece islands in the Aegean Sea). FMD causes significant economic losses in Turkey. The disease is being controlled using vaccination, quarantine, movement controls, and surveillance and monitoring. During the first nine months of 2000, there were 100 outbreaks in Turkey, at least one of which was 100 km west of Istanbul and not far from the border with Greece.

The geographical situation in Turkey is always a risk factor for the dissemination of contagious diseases, mainly from its eastern and southeastern neighbors. Turkey has increased its efforts to control illegal animal movements through borders but it is still a problem. General animal movements within the country are from eastern borders toward the western part of the country, i.e., towards Greece.

Turkey has increased its efforts to control FMD in recent years. It is training more technical personnel, primarily in the provinces close to the borders with Iran and Iraq, by stressing the importance and risks of the serotype Asia 1 epidemics. Farmers in eastern Turkey are being encouraged to slaughter their animals in the slaughterhouses in the eastern region rather than transporting to the West. The Ministry of Agriculture and Rural Affairs (MARA) has implemented an emergency action plan. Measures taken include:

- disinfecting all vehicles crossing through the borders,

- closing the animal markets and not allowing the dispatch of the livestock from eastern provinces,
- more strict security and traffic controls of the trucks on the overland routes,
- regular control and disinfecting of animal markets,
- warning the farmers about the importance of the situation,
- sending regular development reports to MARA, and
- application of legal measures and penalties when necessary.

Turkey carries out semiannual vaccination programs. The General Directorate of Protection and Control (GDPC) used a trivalent vaccine (A, O_1 and Asia 1) in all regions of the country for the autumn (2000) vaccination program. Prior to this program, partially funded by the EU, vaccination against Asia 1 was not part of the semiannual vaccination programs. Turkey has also been investing significant amounts of money to increase the quantity and quality of FMD vaccines. Privatization of vaccine production is in progress and supported by MARA.

It is clear that Asia 1 and subtypes of FMDV serotype A are a potential risk for Turkey and also for Europe. Turkey should be considered a high-risk area regarding the transmission of the disease to Greece and the rest of Europe.

Bulgaria

There were no outbreaks of FMD reported to the OIE by Bulgaria in 2000 and through June 2001 (5).

Macedonia (F.Y.R.O.M.)

There were no outbreaks of FMD reported to the OIE by the Former Yugoslav Republic of Macedonia in 2000. No data is available for 2001 (5).

Albania

There were no outbreaks of FMD reported to the OIE by Albania in 2000. No data is available for 2001 (5).

Separation of the region from regions of higher risk through physical or other barriers

The Evros River defines the border between Greece and Turkey. This border is tightly controlled. However, it is likely that persons and animals still cross the river undetected, thus posing a risk of transmitting FMDV from Turkey. The Evros River, or the Maritsa River as it is shown in Encarta (29), originates in Bulgaria and major tributaries flow into it from Turkey on its way to the Aegean Sea. We do not know what controls regulate persons, animals or meat products that might float down the river via boat and disembark on the Evros delta. There is a Greece military presence, including observation towers, on the border between Greece and Turkey and, presumably, boats landing on the Greece side of the river would be examined. This, however, constitutes a source of risk for the transmission of the FMD virus.

There are also major river systems that originate in western Bulgaria and the Former Yugoslav Republic of Macedonia (F.Y.R.O.M.) that flow through Greece to the Aegean Sea. Neither of these countries has reported an outbreak of FMD to the OIE during 2000 or through July of 2001.

The general border of Greece with Bulgaria, the F.Y.R.O.M., and Albania is mountainous, concentrating movements in the river valleys but making the mountainous part of the borders more difficult to monitor. This is not considered to be a significant source of risk.

Italy lies to the west across the Ionian Sea, a distance of 70 miles at the closest point to Greece and 50 miles to the closest point in Albania. Italy lies 400 miles to the west of the FMD outbreak sites on the Evros delta in Greece.

There are several Greek islands that lie in the Aegean Sea directly to the south of the Evros delta along the Turkey mainland. Greece has special surveillance programs in effect on these islands to prevent the transmission of FMDV from Turkey to Greece via these islands (4).

Control of movements of animals and animal products from regions of higher risk

The movement of animals and animal products from non-EU countries is regulated according to EU legislation. These regulations prohibit the entry of live susceptible animals and risky products from regions of higher risk, including Turkey.[7] In general, these movements are well controlled through established border posts (1). The border between Greece and Turkey is well protected by military and other control points. However, as established earlier in this report, animal contacts and movements across the Evros delta area can occur.

Livestock demographics and marketing practices in the region

The area where the outbreak occurred in 2000 is located in the Evros River delta, immediately adjacent to the border with Turkey. The Evros delta lies entirely within Greek territory. The entire delta area is a wildlife sanctuary protected by the Ramsar Convention (30) and thus is not inhabited. Arable land within the delta is cultivated with various crops - corn, alfalfa, cotton and tobacco. The marshland along the river and the crop fields after harvest provide year-round pasture for cattle, sheep and goats. The delta can sustain more than 5,000 cattle and approximately 2,000 sheep and goats. The majority of the cattle are free grazing beef cattle that move freely throughout the area. All cattle and most sheep and goats inside the delta are individually identified using unique ear tags. As outlined in the EVROS program, all animal movements in the prefecture of Evros, including the delta area, are controlled via permits (23).

[7] No information could be uncovered detailing the number of inspections, animals denied entry, or the quantities of confiscated products.

Emergency response capability

FMD is a compulsorily notifiable disease in Greece and a stamping out policy is enforced in the event of an outbreak. Control measures specified in EU legislation (11) are the basis for emergency measures with additional surveillance and controls as necessary. The Greek Ministry of Agriculture has the regulations, authority, and resources to rapidly detect and effectively respond to an outbreak of FMD (23). This was demonstrated by the response to the incursion of FMDV in 2000 that resulted in rapid control combined with established surveillance programs to detect further spread of the disease. However, the EU requires that these emergency measures be held in place for only 30 days following the last disease outbreak.

Summary of Status Evaluation

From information provided or known for Greece, APHIS selected factors that might contribute to the FMD risk associated within and adjacent to the previously (2000) infected region in Greece. This status evaluation documents the following information.

- FMD has been effectively controlled and eradicated from Greece
- FMD is not known to exist in Greece at this time
- Greece maintains a surveillance system capable of rapidly detecting FMD should the disease be introduced into the country, with more intense scrutiny in the Evros delta bordering Turkey
- Greece has the laws, policies and infrastructure to detect, respond to, and eliminate any occurrence of FMD
- Greece is working closely with neighboring countries and member states to address risk factors presented by those potential sources
- The animal health status in the Greek Evros prefecture will continue to be closely monitored.

There are two potential sources of FMD risk in Greece and, thus, to animal/animal product trade with the United States. First, FMD in other Member States of the EU; however, these outbreaks have apparently not spread to Greece because of adequate monitoring and surveillance. The second source of risk is Turkey that we consider to present the higher risk of introducing FMDV into Greece.

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